



#3

RB-125-SEQ SEQUENCE LISTING

Sequence File Name: RB125seq.txt

&lt;110&gt; Horwath, K. L. and Easton, C. M.

<120> Nucleic Acid Sequences Encoding Type III Tenebrio  
Antifreeze Proteins and Method for Assaying Activity.

&lt;130&gt; RB-125-SEQ

&lt;140&gt; 09/876,796

&lt;141&gt; 2001-06-07

&lt;150&gt; 60/210,446

&lt;151&gt; 2000-06-08

&lt;160&gt; 48

&lt;170&gt; Microsoft Word

&lt;210&gt; 1

&lt;211&gt; 19

&lt;212&gt; PRT

&lt;213&gt; Tenebrio molitor

&lt;223&gt; N-terminal sequence of protein Tm 12.86

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5

10

15

Gln Gln Val

19

&lt;210&gt; 2

&lt;211&gt; 576

&lt;212&gt; DNA

&lt;213&gt; Tenebrio molitor

&lt;223&gt; Non-his-tagged, signal plus, Tm 13.17

&lt;400&gt; 2

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46

Met Lys Leu Leu

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tgt tgt cta atc tcc ctc att ctg ttg gtc,aca gtt cag gcc ctg

91

Cys Cys Leu Ile Ser Leu Ile Leu Leu Val Thr Val Gln Ala Leu

-10

-5

1

acc gag gca caa att gag aaa ctg aac aag atc agc aaa aaa tgt

136

Thr Glu Ala Gln Ile Glu Lys Leu Asn Lys Ile Ser Lys Lys Cys

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10

15

caa aat gaa agt gga gtg tcg caa gag atc ata acc aaa gct cgc

181

Gln Asn Glu Ser Gly Val Ser Gln Glu Ile Ile Thr Lys Ala Arg

20

25

30

aac ggt gac tgg gag gac gat cct aaa ctg aaa cgc caa gtt ttt 226  
 Asn Gly Asp Trp Glu Asp Asp Pro Lys Leu Lys Arg Gln Val Phe  
 35 40 45  
 tgc gtg gcc agg aac gcc ggt ctg gcc acg gaa tcg gga gag gtg 271  
 Cys Val Ala Arg Asn Ala Gly Leu Ala Thr Glu Ser Gly Glu Val  
 50 55 60  
 gtg gtc gac gtg ttg agg gag aag gtg agg aag gtc act gac aac 316  
 Val Val Asp Val Leu Arg Glu Lys Val Arg Lys Val Thr Asp Asn  
 65 70 75  
 gac gaa gaa act gag aaa atc atc aat aag tgc gcc gtc aag aga 361  
 Asp Glu Glu Thr Glu Lys Ile Ile Asn Lys Cys Ala Val Lys Arg  
 80 85 90  
 gat act gtt gaa gag acg gtg ttc aat act ttc aaa tgt gtc atg 406  
 Asp Thr Val Glu Glu Thr Val Phe Asn Thr Phe Lys Cys Val Met  
 95 100 105  
 aaa aac aag cca aag ttc tca cca gtt gat tga accaccacga 449  
 Lys Asn Lys Pro Lys Phe Ser Pro Val Asp  
 110 115  
 ctagtagatg gttcaaattgg tgtgctttac atataa<sup>aa</sup>aat aaagtgtttc 499  
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 cggccgcggg cccatcgttt tccaccc 576

<210> 3

<211> 134

<212> PRT

<213> *Tenebrio molitor*

<223> Precursor Protein for Tm 13.17

<400> 3

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Gln Ala Leu Thr Glu Ala Gln Ile Glu Lys Leu Asn Lys Ile Ser Lys  
 1 5 10

Lys Cys Gln Asn Glu Ser Gly Val Ser Gln Glu Ile Ile Thr Lys Ala  
 15 20 25 30

Arg Asn Gly Asp Trp Glu Asp Asp Pro Lys Leu Lys Arg Gln Val Phe  
 35 40 45

Cys Val Ala Arg Asn Ala Gly Leu Ala Thr Glu Ser Gly Glu Val Val  
 50 55 60

Val Asp Val Leu Arg Glu Lys Val Arg Lys Val Thr Asp Asn Asp Glu  
 65 70 75

Glu Thr Glu Lys Ile Ile Asn Lys Cys Ala Val Lys Arg Asp Thr Val  
 80 85 90

Glu Glu Thr Val Phe Asn Thr Phe Lys Cys Val Met Lys Asn Lys Pro  
 95 100 105 110

Lys Phe Ser Pro Val Asp  
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<210> 4  
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 <212> PRT  
 <213> Tenebrio molitor

<223> Mature Protein for Tm 13.17

<400> 4  
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Gln Asn Glu Ser Gly Val Ser Gln Glu Ile Ile Thr Lys Ala Arg Asn  
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Gly Asp Trp Glu Asp Asp Pro Lys Leu Lys Arg Gln Val Phe Cys Val  
 35 40 45

Ala Arg Asn Ala Gly Leu Ala Thr Glu Ser Gly Glu Val Val Val Asp  
 50 55 60

Val Leu Arg Glu Lys Val Arg Lys Val Thr Asp Asn Asp Glu Glu Thr  
 65 70 75 80

Glu Lys Ile Ile Asn Lys Cys Ala Val Lys Arg Asp Thr Val Glu Glu  
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Thr Val Phe Asn Thr Phe Lys Cys Val Met Lys Asn Lys Pro Lys Phe  
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Ser Pro Val Asp  
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 <211> 481  
 <212> DNA  
 <213> Tenebrio molitor

<223> Non-His-tagged, Signal plus, Clone 2.2

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caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gat gat			181
Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp			
25	30	35	
ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act gga			226
Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly			
40	45	50	
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Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala			
55	60	65	
aag ctg aag cat gtg gcc agc gac gaa gag gtg gac aag atc gtg			316
Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val			
70	75	80	
cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct tat			361
Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr			
85	90	95	
gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct cct			406
Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro			
100	105	110	
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Ile Asp			
115			
tcgttatgta aaaaaaaaaa aaaaaa			481
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<212> DNA			
<213> Tenebrio molitor			
<223> Non-His-tagged, Signal plus, Clone 2.3			
<400> 6			
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Met Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala			
-15	-10		
atc gtc atc gga gct cag gct ctc acc gac gaa cag ata cag aaa			91
Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys			
-5	1	5	
agg aac aag atc agc aaa gaa tgc cag cag gtg tcc gga gtg tcc			136
Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val Ser			
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caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac gat 181  
 Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp  
 25 30 35  
  
 ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act gga 226  
 Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly  
 40 45 50  
  
 gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa gcc 271  
 Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala  
 55 60 65  
  
 aag ctg aag cat gtg gcc agc gac gaa gaa gtg gac aag atc gtg 316  
 Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val  
 70 75 80  
  
 cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct tat 361  
 Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr  
 85 90 95  
  
 gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct cct 406  
 Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro  
 100 105 110  
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 tcgttatgaa aaaaaaaaaa aaaaaaa 482

<210> 7  
 <211> 133  
 <212> PRT  
 <213> Tenebrio molitor

<223> Precursor Protein for Tm 12.84, Clones 2.2, 2.3, and 7.5

<400> 7  
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Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys  
 1 5 10

Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val  
 15 20 25 30

Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu  
 35 40 45

Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn  
 50 55 60

Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu  
 65 70 75

Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu

80 85 90

Glu Thr Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp  
 95 100 105 110

Phe Ser Pro Ile Asp  
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<210> 8  
 <211> 115  
 <212> PRT  
 <213> Tenebrio molitor

<223> Mature Protein for Tm 12.84, Clones 2.2, 2.3, and 7.5

<400> 8  
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Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val Arg Thr  
 20 25 30

Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu Cys Phe  
 35 40 45

Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu  
 50 55 60

Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp  
 65 70 75 80

Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr  
 85 90 95

Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser  
 100 105 110

Pro Ile Asp  
 115

<210> 9  
 <211> 481  
 <212> DNA  
 <213> Tenebrio molitor

<223> Non-His-tagged, Signal plus, Clone 3.4

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 Met Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala  
 -15 -10

atc gtc atc gga gct cag gct ctc acc gac gaa cag ata cag aaa 91  
 Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys  
 -5 1 5

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agg aac aag atc agc aaa gaa tgc cag cag gtg tcc gga gtg tcc 136
Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val Ser
10 15 20

caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac gat 181
Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp
25 30 35

ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act gga 226
Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly
40 45 50

gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa gcc 271
Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala
55 60 65

aag ctg aag cat gtg gcc agc gac gaa gag gtg gac aag atc gtg 316
Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val
70 75 80

cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct tat 361
Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr
85 90 95

gac acc ttc aag gtt att tac gac agt aaa cct gat ttc tct cct 406
Asp Thr Phe Lys Val Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro
100 105 110

att gat taa ttgttttgta tttgactgaa ttttgacaat aaaggtacta 455
Ile Asp
115

tcgttatgta aaaaaaaaaa aaaaaa 481

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<210> 10
<211> 133
<212> PRT
<213> Tenebrio molitor

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<223> Precursor Protein for Clone 3.4

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<400> 10
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Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys
1 5 10

Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val
15 20 25 30

Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu
35 40 45

Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn

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 Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu  
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 Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu  
       80                      85                      90  
 Glu Thr Ala Tyr Asp Thr Phe Lys Val Ile Tyr Asp Ser Lys Pro Asp  
  95                      100                      105                      110  
 Phe Ser Pro Ile Asp  
                     115

<210> 11  
 <211> 115  
 <212> PRT  
 <213> Tenebrio molitor

<223> Mature Protein for Clone 3.4

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                     20                      25                      30  
 Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu Cys Phe  
       35                      40                      45  
 Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu  
  50                      55                      60  
 Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp  
  65                      70                      75                      80  
 Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr  
                     85                      90                      95  
 Ala Tyr Asp Thr Phe Lys Val Ile Tyr Asp Ser Lys Pro Asp Phe Ser  
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 Pro Ile Asp  
       115

<210> 12  
 <211> 482  
 <212> DNA  
 <213> Tenebrio molitor

<223> Non-His-tagged, Signal plus, Clone 3.9

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atc gtc atc gga gct cag gct ctc acc gat gaa cag ata cag aaa 91  
 Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys  
 -5 1 5

agg aac aag atc agc aaa gaa tgc cag cag gag tcc gga gtg tcc 136  
 Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Glu Ser Gly Val Ser  
 10 15 20

caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac gat 181  
 Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp  
 25 30 35

ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aga act gga 226  
 Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Arg Thr Gly  
 40 45 50

gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa gcc 271  
 Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala  
 55 60 65

aag ctg aag cat gtg gcc agc gac gaa gaa gtg gac aag atc gtg 316  
 Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val  
 70 75 80

cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct tat 361  
 Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr  
 85 90 95

gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct cct 406  
 Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro  
 100 105 110

att gat taa ttgttttgta tttgactgaa ttttgacaat aaaggtacta 455  
 Ile Asp  
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tcgttatgaa aaaaaaaaaa aaaaaaa 482

<210> 13  
 <211> 133  
 <212> PRT  
 <213> Tenebrio molitor

<223> Precursor Protein for Clone 3.9

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 1 5 10

Glu Cys Gln Gln Glu Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val

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Arg	Thr	Gly	Val	Leu	Val	Asp	Asp	Pro	Lys	Met	Lys	Lys	His	Val	Leu
			35						40					45	
Cys	Phe	Ser	Lys	Arg	Thr	Gly	Val	Ala	Thr	Glu	Ala	Gly	Asp	Thr	Asn
			50					55					60		
Val	Glu	Val	Leu	Lys	Ala	Lys	Leu	Lys	His	Val	Ala	Ser	Asp	Glu	Glu
		65					70					75			
Val	Asp	Lys	Ile	Val	Gln	Lys	Cys	Val	Val	Lys	Lys	Ala	Thr	Pro	Glu
	80					85					90				
Glu	Thr	Ala	Tyr	Asp	Thr	Phe	Lys	Cys	Ile	Tyr	Asp	Ser	Lys	Pro	Asp
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Phe	Ser	Pro	Ile	Asp											
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<210> 14  
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 <212> PRT  
 <213> Tenebrio molitor

<223> Mature protein for Clone 3.9

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			20					25					30		
Gly	Val	Leu	Val	Asp	Asp	Pro	Lys	Met	Lys	Lys	His	Val	Leu	Cys	Phe
		35					40					45			
Ser	Lys	Arg	Thr	Gly	Val	Ala	Thr	Glu	Ala	Gly	Asp	Thr	Asn	Val	Glu
	50					55					60				
Val	Leu	Lys	Ala	Lys	Leu	Lys	His	Val	Ala	Ser	Asp	Glu	Glu	Val	Asp
65					70				75					80	
Lys	Ile	Val	Gln	Lys	Cys	Val	Val	Lys	Lys	Ala	Thr	Pro	Glu	Glu	Thr
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Ala	Tyr	Asp	Thr	Phe	Lys	Cys	Ile	Tyr	Asp	Ser	Lys	Pro	Asp	Phe	Ser
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Pro	Ile	Asp													
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<210> 15  
 <211> 481  
 <212> DNA

<213> Tenebrio molitor

<223> Non-his-tagged, Signal plus, Clone 7.5

<400> 15

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Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys

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agg aac aag atc agc aaa gag tgc cag cag gtg tcc gga gtg tcc 136

Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val Ser

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15

20

caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac gat 181

Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp

25

30

35

ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act gga 226

Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly

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45

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gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa gcc 271

Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala

55

60

65

aag ctg aag cat gtg gcc agc gac gaa gag gtg gac aag atc gtg 316

Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val

70

75

80

cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct tat 361

Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr

85

90

95

gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct cct 406

Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro

100

105

110

att gat taa ttgttttgta ttggttgtaa ttttgacaat aaaggtacta 455

Ile Asp

115

tcgttatgta aaaaaaaaaa aaaaaa 481

<210> 16

<211> 681

<212> DNA

<213> Tenebrio molitor

<223> His-tagged, Signal plus, Clone 2.2

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agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly -45 -40 -35	141
gga cag caa atg ggt cgc gga tcc gaa ttc gca cga gca aaa atg Gly Gln Gln Met Gly Arg Gly Ser Glu Phe Ala Arg Ala Lys Met -30 -25 -20	186
aaa ctc ctc ttg tgc ttt gcg ttc gcc gcc atc gtc atc gga gct Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala Ile Val Ile Gly Ala -15 -10 -5	231
cag gct ctc acc gac gaa cag ata cag aaa agg aac aag atc agc Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser 1 5 10	276
aaa gaa tgc cag cag gtg tcc gga gtg tcc caa gag acg atc gac Lys Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp 15 20 25	321
aaa gtc cgc aca ggt gtc ttg gtc gat gat ccc aaa atg aag aag Lys Val Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys 30 35 40	366
cac gtc ctc tgc ttc tcg aag aaa act gga gtg gca acc gaa gcc His Val Leu Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala 45 50 55	411
gga gac acc aat gtg gag gta ctc aaa gcc aag ctg aag cat gtg Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu Lys His Val 60 65 70	456
gcc agc gac gaa gag gtg gac aag atc gtg cag aag tgc gtg gtc Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys Val Val 75 80 85	501
aag aag gcc aca cca gag gaa acg gct tat gac acc ttc aag tgt Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys Cys 90 95 100	546
att tac gac agt aaa cct gat ttc tct cct att gat taa ttgttttgta Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp 105 110 115	595
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<210> 17  
<211> 173  
<212> PRT

<213> Tenebrio molitor

<223> Precursor Protein with His-tag, Clone 2.2

<400> 17

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-25 -20 -15

Phe Ala Ala Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile  
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Gln Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val  
10 15 20

Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp  
25 30 35

Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly Val  
40 45 50

Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu  
55 60 65 70

Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys  
75 80 85

Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys  
90 95 100

Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp  
105 110 115

<210> 18

<211> 543

<212> DNA

<213> Tenebrio molitor

<223> His-tagged, signal minus, Clone 2.2

<400> 18

ttgtagcgg atggaattcc ctgtagggg ataattttgt ttactttaag 50

aaggagatat acc atg ggc agc agc cat cat cat cat cat cac agc 96  
Met Gly Ser Ser His His His His His His Ser  
-30 -25

agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt 141  
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly  
-20 -15 -10

gga cag caa atg ggt cgc gga tcc ctc acc gac gaa cag ata cag	186
Gly Gln Gln Met Gly Arg Gly Ser Leu Thr Asp Glu Gln Ile Gln	
-5 1 5	
aaa agg aac aag atc agc aaa gaa tgc cag-cag gtg tcc gga gtg	231
Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val	
10 15 20	
tcc caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gat	276
Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp	
25 30 35	
gat ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act	321
Asp Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr	
40 45 50	
gga gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa	366
Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys	
55 60 65	
gcc aag ctg aag cat gtg gcc agc gac gaa gag gtg gac aag atc	411
Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile	
70 75 80	
gtg cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct	456
Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala	
85 90 95	
tat gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct	501
Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser	
100 105 110	
cct att gat taa ctgcagcacc accaccacca ccactgagat	543
Pro Ile Asp	
115	

<210> 19  
 <211> 149  
 <212> PRT  
 <213> Tenebrio molitor

<223> Mature Protein with His-tag, Clone 2.2

<400> 19	
Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro	
-30 -25 -20	
Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg	
-15 -10 -5	
Gly Ser Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys	
1 5 10	
Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val	
15 20 25 30	

Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu  
                     35                    40                    45  
 Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn  
                     50                    55                    60  
 Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu  
                     65                    70                    75  
 Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu  
                     80                    85                    90  
 Glu Thr Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp  
                     95                    100                    105                    110  
 Phe Ser Pro Ile Asp  
                     115

<210> 20  
 <211> 682  
 <212> DNA  
 <213> Tenebrio molitor

<223> His-tagged, Signal Plus, Clone 2.3

<400> 20  
 ttgttagcgg atggaattcc ctcgtagggg ataattttgt ttactttaag 50  
 aaggagatat acc atg ggc agc agc cat cat cat cat cat cac agc 96  
                     Met Gly Ser Ser His His His His His His Ser  
                                     -55                                    -50  
 agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt 141  
 Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly  
                     -45                    -40                    -35  
 gga cag caa atg ggt cgc gga tcc gaa ttc gca cga gca aaa atg 186  
 Gly Gln Gln Met Gly Arg Gly Ser Glu Phe Ala Arg Ala Lys Met  
                     -30                    -25                    -20  
 aaa ctc ctc ttg tgc ttt gct ttc gcc gcc atc gtc atc gga gct 231  
 Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala Ile Val Ile Gly Ala  
                     -15                    -10                    -5  
 cag gct ctc acc gac gaa cag ata cag aaa agg aac aag atc agc 276  
 Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser  
                     1                    5                    10  
 aaa gaa tgc cag cag gtg tcc gga gtg tcc caa gag acg atc gac 321  
 Lys Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp  
                     15                    20                    25  
 aaa gtc cgc aca ggt gtc ttg gtc gat gat ccc aaa atg aag aag 366  
 Lys Val Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys  
                     30                    35                    40

cac gtc ctc tgc ttc tcg aag aaa act gga gtg gca acc gaa gcc	411
His Val Leu Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala	
45 50 55	
gga gac acc aat gtg gag gta ctc aaa gcc-aag ctg aag cat gtg	456
Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu Lys His Val	
60 65 70	
gcc agc gac gaa gaa gtg gac aag atc gtg cag aag tgc gtg gtc	501
Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys Val Val	
75 80 85	
aag aag gcc aca cca gag gaa acg gct tat gac acc ttc aag tgt	546
Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys Cys	
90 95 100	
att tac gac agt aaa cct gat ttc tct cct att gat taa ttgttttgta	595
Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp	
105 110 115	
tttgactgaa ttttgacaat aaaggtacta tcgttatgaa aaaaaaaaaa	645
aaaaaaaaactc gagcaccacc accaccacca ctgagat	682

<210> 21  
 <211> 173  
 <212> PRT  
 <213> Tenebrio molitor

<223> Precursor Protein with His-tag, Clone 2.3

<400> 21  
 Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro  
 -55 -50 -45  
 Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg  
 -40 -35 -30  
 Gly Ser Glu Phe Ala Arg Ala Lys Met Lys Leu Leu Leu Cys Phe Ala  
 -25 -20 -15  
 Phe Ala Ala Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile  
 -10 -5 1 5  
 Gln Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val  
 10 15 20  
 Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp  
 25 30 35  
 Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly Val  
 40 45 50  
 Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu  
 55 60 65 70



Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys  
75 80 85

Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys  
90 95 100

Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp  
105 110 115

<210> 22  
<211> 543  
<212> DNA  
<213> *Tenebrio molitor*

<223> His-tagged, Signal minus, Clone 2.3

<400> 22  
ttgttagcgg atggaattcc ctcgtagggg ataattttgt ttactttaag 50  
aaggagatat acc atg ggc agc agc cat cat cat cat cat cac agc 96  
Met Gly Ser Ser His His His His His His Ser  
-30 -25  
agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt 141  
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly  
-20 -15 -10  
gga cag caa atg ggt cgc gga tcc ctc acc gac gaa cag ata cag 186  
Gly Gln Gln Met Gly Arg Gly Ser Leu Thr Asp Glu Gln Ile Gln  
-5 1 5  
aaa agg aac aag atc agc aaa gaa tgc cag cag gtg tcc gga gtg 231  
Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val  
10 15 20  
tcc caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gat 276  
Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp  
25 30 35  
gat ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act 321  
Asp Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr  
40 45 50  
gga gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa 366  
Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys  
55 60 65  
gcc aag ctg aag cat gtg gcc agc gac gaa gaa gtg gac aag atc 411  
Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile  
70 75 80  
gtg cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct 456  
Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala  
85 90 95  
tat gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct 501

Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser  
 100 105 110

cct att gat taa ctcgagcacc accaccacca ccactgagat 543  
 Pro Ile Asp  
 115

<210> 23  
 <211> 149  
 <212> PRT  
 <213> Tenebrio molitor

<223> Mature Protein with His-tag, Clone 2.3

<400> 23  
 Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro  
 -30 -25 -20

Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg  
 -15 -10 -5

Gly Ser Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys  
 1 5 10

Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val  
 15 20 25 30

Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu  
 35 40 45

Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn  
 50 55 60

Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu  
 65 70 75

Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu  
 80 85 90

Glu Thr Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp  
 95 100 105 110

Phe Ser Pro Ile Asp  
 115

<210> 24  
 <211> 776  
 <212> DNA  
 <213> Tenebrio molitor

<223> His-tagged, Signal plus, Tm 13.17

<400> 24  
 ttgttagcgg atggaattcc ctcgtagggg ataattttgt ttactttaag 50

aaggagatat acc atg ggc agc agc cat cat cat cat cat cac agc	96
Met Gly Ser Ser His His His His His His Ser	
-65 -60 -55	
agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt	141
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly	
-50 -45 -40	
gga cag caa atg ggt cgc gga tcc gaa ttc tgg atc caa aga att	186
Gly Gln Gln Met Gly Arg Gly Ser Glu Phe Trp Ile Gln Arg Ile	
-35 -30 -25	
cgg cac gag act act aag atg aag ttg ctc tgt tgt cta atc tcc	231
Arg His Glu Thr Thr Lys Met Lys Leu Leu Cys Cys Leu Ile Ser	
-20 -15 -10	
ctc att ctg ttg gtc aca gtt cag gcc ctg acc gag gca caa att	276
Leu Ile Leu Leu Val Thr Val Gln Ala Leu Thr Glu Ala Gln Ile	
-5 1 5	
gag aaa ctg aac aag atc agc aaa aaa tgt caa aat gaa agt gga	321
Glu Lys Leu Asn Lys Ile Ser Lys Lys Cys Gln Asn Glu Ser Gly	
10 15 20	
gtg tcg caa gag atc ata acc aaa gct cgc aac ggt gac tgg gag	366
Val Ser Gln Glu Ile Ile Thr Lys Ala Arg Asn Gly Asp Trp Glu	
25 30 35	
gac gat cct aaa ctg aaa cgc caa gtt ttt tgc gtg gcc agg aac	411
Asp Asp Pro Lys Leu Lys Arg Gln Val Phe Cys Val Ala Arg Asn	
40 45 50	
gcc ggt ctg gcc acg gaa tcg gga gag gtg gtg gtc gac gtg ttg	456
Ala Gly Leu Ala Thr Glu Ser Gly Glu Val Val Val Asp Val Leu	
55 60 65	
agg gag aag gtg agg aag gtc act gac aac gac gaa gaa act gag	501
Arg Glu Lys Val Arg Lys Val Thr Asp Asn Asp Glu Glu Thr Glu	
70 75 80	
aaa atc atc aat aag tgc gcc gtc aag aga gat act gtt gaa gag	546
Lys Ile Ile Asn Lys Cys Ala Val Lys Arg Asp Thr Val Glu Glu	
85 90 95	
acg gtg ttc aat act ttc aaa tgt gtc atg aaa aac aag cca aag	591
Thr Val Phe Asn Thr Phe Lys Cys Val Met Lys Asn Lys Pro Lys	
100 105 110	
ttc tca cca gtt gat tga accaccacga ctagtagatg gttcaaatgg	639
Phe Ser Pro Val Asp	
115	
tgtgctttac atataaaaat aaagtgtttc tgatgtaaaa aaaaaaaaaa	689
aaaaaaaaaa aactcgagag tattctagag cggccgcggg cccatcgttt	739

tccacccctc gagcaccacc accaccacca ctgagat

776

<210> 25  
<211> 174  
<212> PRT  
<213> Tenebrio molitor

<223> Precursor Protein with His-tag, Tm 13.17

<400> 25  
Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro  
                  -55                                  -50                                  -45  
  
Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg  
                  -40                                  -35                                  -30  
  
Gly Ser Glu Phe Ala Arg Ala Lys Met Lys Leu Leu Cys Cys Leu Ile  
                  -25                                  -20                                  -15  
  
Ser Leu Ile Leu Leu Val Thr Val Gln Ala Leu Thr Glu Ala Gln Ile  
                  -10                                  -5                                  1                                  5  
  
Glu Lys Leu Asn Lys Ile Ser Lys Lys Cys Gln Asn Glu Ser Gly Val  
                  10                                  15                                  20  
  
Ser Gln Glu Ile Ile Thr Lys Ala Arg Asn Gly Asp Trp Glu Asp Asp  
                  25                                  30                                  35  
  
Pro Lys Leu Lys Arg Gln Val Phe Cys Val Ala Arg Asn Ala Gly Leu  
                  40                                  45                                  50  
  
Ala Thr Glu Ser Gly Glu Val Val Val Asp Val Leu Arg Glu Lys Val  
55                                  60                                  65                                  70  
  
Arg Lys Val Thr Asp Asn Asp Glu Glu Thr Glu Lys Ile Ile Asn Lys  
                  75                                  80                                  85  
  
Cys Ala Val Lys Arg Asp Thr Val Glu Glu Thr Val Phe Asn Thr Phe  
                  90                                  95                                  100  
  
Lys Cys Val Met Lys Asn Lys Pro Lys Phe Ser Pro Val Asp  
                  105                                  110                                  115

<210> 26  
<211> 543  
<212> DNA  
<213> Tenebrio molitor

<223> His-tagged, Signal minus, Tm 13.17

<400> 26  
ttgttagcgg atggaattcc ctcgtagggg ataattttgt ttactttaag 50  
  
aaggagatat acc atg ggc agc agc cat cat cat cat cat cac agc 96  
                  Met Gly Ser Ser His His His His His His Ser

-30

-25

agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt 141  
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly  
-20 -15 -10

gga cag caa atg ggt cgc ggc ctg acc gag gca caa att gag aaa 186  
Gly Gln Gln Met Gly Arg Gly Leu Thr Glu Ala Gln Ile Glu Lys  
-5 1 5

ctg aac aag atc agc aaa aaa tgt caa aat gaa agt gga gtg tcg 231  
Leu Asn Lys Ile Ser Lys Lys Cys Gln Asn Glu Ser Gly Val Ser  
10 15 20

caa gag atc ata acc aaa gct cgc aac ggt gac tgg gag gac gat 276  
Gln Glu Ile Ile Thr Lys Ala Arg Asn Gly Asp Trp Glu Asp Asp  
25 30 35

cct aaa ctg aaa cgc caa gtt ttt tgc gtg gcc agg aac gcc ggt 321  
Pro Lys Leu Lys Arg Gln Val Phe Cys Val Ala Arg Asn Ala Gly  
40 45 50

ctg gcc acg gaa tcg gga gag gtg gtg gtc gac gtg ttg agg gag 366  
Leu Ala Thr Glu Ser Gly Glu Val Val Val Asp Val Leu Arg Glu  
55 60 65

aag gtg agg aag gtc act gac aac gac gaa gaa act gag aaa atc 411  
Lys Val Arg Lys Val Thr Asp Asn Asp Glu Glu Thr Glu Lys Ile  
70 75 80

atc aat aag tgc gcc gtc aag aga gat act gtt gaa gag acg gtg 456  
Ile Asn Lys Cys Ala Val Lys Arg Asp Thr Val Glu Glu Thr Val  
85 90 95

ttc aat act ttc aaa tgt gtc atg aaa aac aag cca aag ttc tca 501  
Phe Asn Thr Phe Lys Cys Val Met Lys Asn Lys Pro Lys Phe Ser  
100 105 110

cca gtt gat tga ctgcgagcacc accaccacca ccactgagat 543  
Pro Val Asp  
115

<210> 27

<211> 149

<212> PRT

<213> Tenebrio molitor

<223> Mature Protein with His-tag, Tm 13.17

<400> 27

Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro  
-30 -25 -20

Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg  
-15 -10 -5

Gly Leu Thr Glu Ala Gln Ile Glu Lys Leu Asn Lys Ile Ser Lys Lys  
 1 5 10 15  
 Cys Gln Asn Glu Ser Gly Val Ser Gln Glu Ile Ile Thr Lys Ala Arg  
 20 25 30  
 Asn Gly Asp Trp Glu Asp Asp Pro Lys Leu Lys Arg Gln Val Phe Cys  
 35 40 45  
 Val Ala Arg Asn Ala Gly Leu Ala Thr Glu Ser Gly Glu Val Val Val  
 50 55 60  
 Asp Val Leu Arg Glu Lys Val Arg Lys Val Thr Asp Asn Asp Glu Glu  
 65 70 75  
 Thr Glu Lys Ile Ile Asn Lys Cys Ala Val Lys Arg Asp Thr Val Glu  
 80 85 90 95  
 Glu Thr Val Phe Asn Thr Phe Lys Cys Val Met Lys Asn Lys Pro Lys  
 100 105 110  
 Phe Ser Pro Val Asp  
 115

<210> 28  
 <211> 681  
 <212> DNA  
 <213> *Tenebrio molitor*

<223> His-tagged, Signal plus, Clone 3.4

<400> 28  
 ttgttagcgg atggaattcc ctcgtagggg ataattttgt ttactttaag 50  
 aaggagatat acc atg ggc agc agc cat cat cat cat cat cac agc 96  
 Met Gly Ser Ser His His His His His His Ser  
 -55 -50  
 agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt 141  
 Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly  
 -45 -40 -35  
 gga cag caa atg ggt cgc gga tcc gaa ttc gca cga gca aaa atg 186  
 Gly Gln Gln Met Gly Arg Gly Ser Glu Phe Ala Arg Ala Lys Met  
 -30 -25 -20  
 aaa ctc ctc ttg tgc ttt gct ttc gcc gcc atc gtc atc gga gct 231  
 Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala Ile Val Ile Gly Ala  
 -15 -10 -5  
 cag gct ctc acc gac gaa cag ata cag aaa agg aac aag atc agc 276  
 Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser  
 1 5 10  
 aaa gaa tgc cag cag gtg tcc gga gtg tcc caa gag acg atc gac 321  
 Lys Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp

15	20	25	
aaa gtc cgc aca ggt gtc ttg gtc gac gat ccc	aaa atg aag aag	366	
Lys Val Arg Thr Gly Val Leu Val Asp Asp Pro	Lys Met Lys Lys		
30	35 40		
cac gtc ctc tgc ttc tcg aag aaa act gga gtg gca acc gaa gcc	411		
His Val Leu Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala			
45	50 55		
gga gac acc aat gtg gag gta ctc aaa gcc aag ctg aag cat gtg	456		
Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu Lys His Val			
60	65 70		
gcc agc gac gaa gag gtg gac aag atc gtg cag aag tgc gtg gtc	501		
Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys Val Val			
75	80 85		
aag aag gcc aca cca gag gaa acg gct tat gac acc ttc aag gtt	546		
Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys Val			
90	95 100		
att tac gac agt aaa cct gat ttc tct cct att gat taa ttgttttgta	595		
Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp			
105	110 115		
tttgactgaa ttttgacaat aaagggtacta tcgttatgta aaaaaaaaaa	645		
aaaaaactcg agcaccacca ccaccaccac tgagat	681		
<p>&lt;210&gt; 29</p> <p>&lt;211&gt; 173</p> <p>&lt;212&gt; PRT</p> <p>&lt;213&gt; Tenebrio molitor</p> <p>&lt;223&gt; Precursor protein with His-tag, Clone 3.4</p> <p>&lt;400&gt; 29</p>			
Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro			
-55 -50 -45			
Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg			
-40 -35 -30			
Gly Ser Glu Phe Ala Arg Ala Lys Met Lys Leu Leu Leu Cys Phe Ala			
-25 -20 -15			
Phe Ala Ala Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile			
-10 -5 1 5			
Gln Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val			
10 15 20			
Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp			
25 30 35			

Pro	Lys	Met	Lys	Lys	His	Val	Leu	Cys	Phe	Ser	Lys	Lys	Thr	Gly	Val
40						45					50				
Ala	Thr	Glu	Ala	Gly	Asp	Thr	Asn	Val	Glu	Val	Leu	Lys	Ala	Lys	Leu
55					60					65					70
Lys	His	Val	Ala	Ser	Asp	Glu	Glu	Val	Asp	Lys	Ile	Val	Gln	Lys	Cys
				75					80					85	
Val	Val	Lys	Lys	Ala	Thr	Pro	Glu	Glu	Thr	Ala	Tyr	Asp	Thr	Phe	Lys
			90					95					100		
Val	Ile	Tyr	Asp	Ser	Lys	Pro	Asp	Phe	Ser	Pro	Ile	Asp			
	105						110					115			

<210> 30  
 <211> 543  
 <212> DNA  
 <213> Tenebrio molitor

<223> His-tagged, Signal minus, Clone 3.4

<400> 30	
ttgtagcgg atggaattcc ctcgtagggg ataattttgt ttactttaag	50
aaggagatat acc atg ggc agc agc cat cat cat cat cac agc	96
Met Gly Ser Ser His His His His His Ser	
-30 -25	
agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt	141
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly	
-20 -15 -10	
gga cag caa atg ggt cgc gga tcc ctc acc gac gaa cag ata cag	186
Gly Gln Gln Met Gly Arg Gly Ser Leu Thr Asp Glu Gln Ile Gln	
-5 1 5	
aaa agg aac aag atc agc aaa gaa tgc cag cag gtg tcc gga gtg	231
Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val	
10 15 20	
tcc caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac	276
Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp	
25 30 35	
gat ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act	321
Asp Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr	
40 45 50	
gga gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa	366
Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys	
55 60 65	
gcc aag ctg aag cat gtg gcc agc gac gaa gag gtg gac aag atc	411
Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile	
70 75 80	



gtg cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct 456  
 Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala  
           85                          90                          95

tat gac acc ttc aag gtt att tac gac agt aaa cct gat ttc tct 501  
 Tyr Asp Thr Phe Lys Val Ile Tyr Asp Ser Lys Pro Asp Phe Ser  
           100                          105                          110

cct att gat taa ctcgagcacc accaccacca ccactgagat 543  
 Pro Ile Asp  
           115

<210> 31  
 <211> 149  
 <212> PRT  
 <213> Tenebrio molitor

<223> Mature Protein with His-tag, Clone 3.4

<400> 31  
 Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro  
                           -30                          -25                          -20

Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg  
                           -15                          -10                          -5

Gly Ser Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys  
           1                          5                          10

Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val  
 15                          20                          25                          30

Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu  
                           35                          40                          45

Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn  
           50                          55                          60

Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu  
           65                          70                          75

Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu  
           80                          85                          90

Glu Thr Ala Tyr Asp Thr Phe Lys Val Ile Tyr Asp Ser Lys Pro Asp  
 95                          100                          105                          110

Phe Ser Pro Ile Asp  
           115

<210> 32  
 <211> 682  
 <212> DNA  
 <213> Tenebrio molitor

<223> His-tagged, Signal plus, Clone 3.9

<400> 32

ttgttagcgg atggaattcc ctgtagggg ataattttgt ttactttaag	50
aaggagatat acc atg ggc agc agc cat cat cat cat cat cac agc	96
Met Gly Ser Ser His His His His His Ser	
-55 -50	
agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt	141
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly	
-45 -40 -35	
gga cag caa atg ggt cgc gga tcc gaa ttc gca cga gca aaa atg	186
Gly Gln Gln Met Gly Arg Gly Ser Glu Phe Ala Arg Ala Lys Met	
-30 -25 -20	
aaa ctc ctc ttg tgc ttt gct ttc gcc gcc atc gtc atc gga gct	231
Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala Ile Val Ile Gly Ala	
-15 -10 -5	
cag gct ctc acc gat gaa cag ata cag aaa agg aac aag atc agc	276
Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser	
1 5 10	
aaa gaa tgc cag cag gag tcc gga gtg tcc caa gag acg atc gac	321
Lys Glu Cys Gln Gln Glu Ser Gly Val Ser Gln Glu Thr Ile Asp	
15 20 25	
aaa gtc cgc aca ggt gtc ttg gtc gac gat ccc aaa atg aag aag	366
Lys Val Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys	
30 35 40	
cac gtc ctc tgc ttc tcg aag aga act gga gtg gca acc gaa gcc	411
His Val Leu Cys Phe Ser Lys Arg Thr Gly Val Ala Thr Glu Ala	
45 50 55	
gga gac acc aat gtg gag gta ctc aaa gcc aag ctg aag cat gtg	456
Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu Lys His Val	
60 65 70	
gcc agc gac gaa gaa gtg gac aag atc gtg cag aag tgc gtg gtc	501
Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys Val Val	
75 80 85	
aag aag gcc aca cca gag gaa acg gct tat gac acc ttc aag tgt	546
Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys Cys	
90 95 100	
att tac gac agt aaa cct gat ttc tct cct att gat taa ttgttttgta	595
Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp	
105 110 115	
tttgactgaa ttttgacaat aaaggacta tcgttatgaa aaaaaaaaaa	645
aaaaaaaaactc gagcaccacc accaccacca ctgagat	682

<210> 33  
 <211> 173  
 <212> PRT  
 <213> Tenebrio molitor

<223> Precursor Protein with His-tag, Clone 3.9

<400> 33  
 Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro  
                   -55                                  -50                                  -45  
 Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg  
                   -40                                  -35                                  -30  
 Gly Ser Glu Phe Ala Arg Ala Lys Met Lys Leu Leu Leu Cys Phe Ala  
                   -25                                  -20                                  -15  
 Phe Ala Ala Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile  
                   -10                                  -5                                  1                                  5  
 Gln Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Glu Ser Gly Val  
                   10                                  15                                  20  
 Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp  
                   25                                  30                                  35  
 Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Arg Thr Gly Val  
                   40                                  45                                  50  
 Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu  
                   55                                  60                                  65                                  70  
 Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys  
                   75                                  80                                  85  
 Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys  
                   90                                  95                                  100  
 Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp  
                   105                                  110                                  115

<210> 34  
 <211> 543  
 <212> DNA  
 <213> Tenebrio molitor

<223> His-tagged, Signal minus, Clone 3.9

<400> 34  
 ttgttagcgg atggaattcc ctcgtagggg ataattttgt ttactttaag 50  
 aaggagatat acc atg ggc agc agc cat cat cat cat cat cac agc 96  
                   Met Gly Ser Ser His His His His His His Ser  
                                   -30                                  -25

```

agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt      141
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly
      -20                      -15                      -10

gga cag caa atg ggt cgc gga tcc ctc acc gat gaa cag ata cag      186
Gly Gln Gln Met Gly Arg Gly Ser Leu Thr Asp Glu Gln Ile Gln
      -5                      1                      5

aaa agg aac aag atc agc aaa gaa tgc cag cag gag tcc gga gtg      231
Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Glu Ser Gly Val
      10                      15                      20

tcc caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac      276
Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp
      25                      30                      35

gat ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aga act      321
Asp Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Arg Thr
      40                      45                      50

gga gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa      366
Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys
      55                      60                      65

gcc aag ctg aag cat gtg gcc agc gac gaa gaa gtg gac aag atc      411
Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile
      70                      75                      80

gtg cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct      456
Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala
      85                      90                      95

tat gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct      501
Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser
      100                      105                      110

cct att gat taa ctcgagcacc accaccacca ccaactgagat      543
Pro Ile Asp
      115

<210> 35
<211> 149
<212> PRT
<213> Tenebrio molitor

<223> Mature Protein with His-tag, Clone 3.9

<400> 35
Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro
      -30                      -25                      -20

Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg
      -15                      -10                      -5

Gly Ser Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys

```

1	5	10	
Glu Cys Gln Gln Glu Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val			
15	20	25	30
Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu			
	35	40	45
Cys Phe Ser Lys Arg Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn			
	50	55	60
Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu			
	65	70	75
Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu			
	80	85	90
Glu Thr Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp			
95	100	105	110
Phe Ser Pro Ile Asp			
	115		

<210> 36  
 <211> 681  
 <212> DNA  
 <213> Tenebrio molitor

<223> His-tagged, Signal plus, Clone 7.5

<400> 36	
ttgttagcgg atggaattcc ctcgtagggg ataattttgt ttactttaag	50
aaggagatat acc atg ggc agc agc cat cat cat cat cat cac agc	96
Met Gly Ser Ser His His His His His His Ser	
-55 -50	
agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt	141
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly	
-45 -40 -35	
gga cag caa atg ggt cgc gga tcc gaa ttc gca cga gca aaa atg	186
Gly Gln Gln Met Gly Arg Gly Ser Glu Phe Ala Arg Ala Lys Met	
-30 -25 -20	
aaa ctc ctc ttg tgc ttt gcg ttc gcc gcc atc gtc atc gga gct	231
Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala Ile Val Ile Gly Ala	
-15 -10 -5	
cag gct ctc acc gac gaa cag ata cag aaa agg aac aag atc agc	276
Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser	
1 5 10	
aaa gag tgc cag cag gtg tcc gga gtg tcc caa gag acg atc gac	321
Lys Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp	
15 20 25	

aaa gtc cgc aca ggt gtc ttg gtc gac gat ccc aaa atg aag aag	366
Lys Val Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys	
30 35 40	

cac gtc ctc tgc ttc tcg aag aaa act gga gtg gca acc gaa gcc	411
His Val Leu Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala	
45 50 55	

gga gac acc aat gtg gag gta ctc aaa gcc aag ctg aag cat gtg	456
Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu Lys His Val	
60 65 70	

gcc agc gac gaa gag gtg gac aag atc gtg cag aag tgc gtg gtc	501
Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys Val Val	
75 80 85	

aag aag gcc aca cca gag gaa acg gct tat gac acc ttc aag tgt	546
Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys Cys	
90 95 100	

att tac gac agt aaa cct gat ttc tct cct att gat taa ttgttttgta	595
Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp	
105 110 115	

tttggctgaa ttttgacaat aaaggtacta tcgttatgta aaaaaaaaaa	645
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aaaaaactcg agcaccacca ccaccaccac tgagat	681
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<210> 37  
 <211> 173  
 <212> PRT  
 <213> Tenebrio molitor

<223> Precursor Protein with His-tag, Clone 7.5

<400> 37	
Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro	
-55 -50 -45	
Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg	
-40 -35 -30	
Gly Ser Glu Phe Ala Arg Ala Lys Met Lys Leu Leu Leu Cys Phe Ala	
-25 -20 -15	
Phe Ala Ala Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile	
-10 -5 1 5	
Gln Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val	
10 15 20	
Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp	

25					30					35					
Pro	Lys	Met	Lys	Lys	His	Val	Leu	Cys	Phe	Ser	Lys	Lys	Thr	Gly	Val
40						45					50				
Ala	Thr	Glu	Ala	Gly	Asp	Thr	Asn	Val	Glu	Val	Leu	Lys	Ala	Lys	Leu
55					60					65					70
Lys	His	Val	Ala	Ser	Asp	Glu	Glu	Val	Asp	Lys	Ile	Val	Gln	Lys	Cys
				75					80					85	
Val	Val	Lys	Lys	Ala	Thr	Pro	Glu	Glu	Thr	Ala	Tyr	Asp	Thr	Phe	Lys
			90					95					100		
Cys	Ile	Tyr	Asp	Ser	Lys	Pro	Asp	Phe	Ser	Pro	Ile	Asp			
	105						110					115			

<210> 38  
 <211> 543  
 <212> DNA  
 <213> Tenebrio molitor

<223> His-tagged, Signal minus, Clone 7.5

<400> 38	
ttgttagcgg atggaattcc ctcgtagggg ataattttgt ttactttaag	50
aaggagatat acc atg ggc agc agc cat cat cat cat cat cac agc	96
Met Gly Ser Ser His His His His His His Ser	
-30 -25	
agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt	141
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly	
-20 -15 -10	
gga cag caa atg ggt cgc gga tcc ctc acc gac gaa cag ata cag	186
Gly Gln Gln Met Gly Arg Gly Ser Leu Thr Asp Glu Gln Ile Gln	
-5 1 5	
aaa agg aac aag atc agc aaa gag tgc cag cag gtg tcc gga gtg	231
Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val	
10 15 20	
tcc caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac	276
Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp	
25 30 35	
gat ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act	321
Asp Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr	
40 45 50	
gga gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa	366
Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys	
55 60 65	
gcc aag ctg aag cat gtg gcc agc gac gaa gag gtg gac aag atc	411

Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile  
70 75 80

gtg cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct 456  
Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala  
85 90 95

tat gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct 501  
Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser  
100 105 110

cct att gat taa ctcgagcacc accaccacca ccactgagat 543  
Pro Ile Asp  
115

<210> 39  
<211> 149  
<212> PRT  
<213> Tenebrio molitor

<223> Mature protein with His-tag, Clone 7.5

<400> 39  
Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro  
-30 -25 -20

Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg  
-15 -10 -5

Gly Ser Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys  
1 5 10

Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val  
15 20 25 30

Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu  
35 40 45

Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn  
50 55 60

Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu  
65 70 75

Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu  
80 85 90

Glu Thr Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp  
95 100 105 110

Phe Ser Pro Ile Asp  
115

<210> 40  
<211> 24



<212> DNA  
 <213> Tenebrio molitor  
  
 <223> Tm 12.84 upper primer with Bam-H1 site (Clones 2.2, 2.3, 3.4, 3.9, and 7.5)  
  
 <400> 40  
 cgcggtatccc tcaccgacga acag 24  
  
 <210> 41  
 <211> 25  
 <212> DNA  
 <213> Tenebrio molitor  
  
 <223> Tm 12.84 lower primer with Xho1 site (Clones 2.2, 2.3, 3.4, 3.9, and 7.5)  
  
 <400> 41  
 gagaggataa ctaattgagc tcgcc 25  
  
 <210> 42  
 <211> 24  
 <212> DNA  
 <213> Tenebrio molitor  
  
 <223> Tm 13.17 upper primer with Bam-H1 site  
  
 <400> 42  
 cgcggtatccc tgaccgaggc acaa 24  
  
 <210> 43  
 <211> 25  
 <212> DNA  
 <213> Tenebrio molitor  
  
 <223> Tm 13.17 lower primer with Xho1 site  
  
 <400> 43  
 gagtgggtcaa ctaactgagc tcgcc 25  
  
 <210> 44  
 <211> 481  
 <212> DNA  
 <213> Tenebrio molitor  
  
 <220>  
 <221> misc\_feature  
 <222>  
 <223> Consensus of the Tm 12.84 Isoforms, 'n' defined as any nucleotide, 'Xaa' defined as any amino acid.  
  
 <400> 44  
 ggcacgagca aaa atg aaa ctc ctc ttg tgc ttt gcn ttc gcc gcc 46

Met Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala  
 -15 -10

atc gtc atc gga gct cag gct ctc acc gay gaa cag ata cag aaa 91  
 Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys  
 -5 1 5

agg aac aag atc agc aaa gar tgc cag cag gng tcc gga gtg tcc 136  
 Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Xaa Ser Gly Val Ser  
 10 15 20

caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gay gat 181  
 Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp  
 25 30 35

ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag ara act gga 226  
 Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly  
 40 45 50

gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa gcc 271  
 Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala  
 55 60 65

aag ctg aag cat gtg gcc agc gac gaa gar gtg gac aag atc gtg 316  
 Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val  
 70 75 80

cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct tat 361  
 Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr  
 85 90 95

gac acc ttc aag nnt att tac gac agt aaa cct gat ttc tct cct 406  
 Asp Thr Phe Lys Xaa Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro  
 100 105 110

att gat taa ttgttttgta tttgrctgaa ttttgacaat aaaggntanta 455  
 Ile Asp  
 115

tcgttatgna aaaaaaaaaa aaaaaa 481

<210> 45  
 <211> 484  
 <212> DNA  
 <213> Tenebrio molitor

<220>  
 <221> misc\_feature  
 <222>  
 <223> Consensus of Seq ID #44 with Tm 13.17, 'n' defined as any nucleotide,  
 'Xaa' defined as any amino acid

<400> 45  
 ggcanrnnnnn aar atg aar ytn ctc tnn tgy ytn ryn tyc nyc ryy 46  
 Met Lys Leu Leu Xaa Cys Phe Ala Phe Ala Ala  
 -15 -10

ntn ntn rtc rna gyt cag gcy ctn acc gan gna car atn nag aaa	91
Xaa Xaa Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys	
-5 1 5	
nng aac aag atc agc aaa rar tgy car nan gnr nny gga gtg tcn	136
Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val Ser	
10 15 20	
caa gag ayn atn rnc aaa gyy cgc ann ggt gnc tng gnn gay gat	181
Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp	
25 30 35	
ccy aaa ntg aar nrn can gty yty tgc ntn ncn arg arn rcy ggn	226
Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly	
40 45 50	
ntg gcn acn gaa ncn gga gan ryn rnn gtn gan gtr ytn arr gnn	271
Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala	
55 60 65	
aag ntg arg nan gtn rcy rrc aac gac gaa gar ryn gan aar atc	316
Lys Leu Lys His Val Ala Ser Asn Asp Glu Glu Val Asp Lys Ile	
70 75 80	
rtn nan aag tgc gyn gtc aag arr gny acn nyn gar gar acg gyn	361
Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala	
85 90 95	
tny ray acy ttc aar nnt rty nnn ran ary aar ccn ran ttc tcn	406
Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser	
100 105 110	
ccn rtt gat tra nynnnyynna ytnngnnnrnr nttyranaat aaagnnnntn	458
Pro Ile Asp	
115	
tnrtnnnrna aaaaaaaaaa aaaaaa	484

<210> 46  
 <211> 484  
 <212> DNA  
 <213> Tenebrio molitor

<220>  
 <221> misc\_feature  
 <222>  
 <223> Consensus of Seq ID #45 with B1/B2, 'n' defined as any nucleotide, 'Xaa'  
 defined as any amino acid,

<400> 46	
ggcanrnnnn aar atg aar ytn ctc tnn tgy ytn ryn tyy nyc ryy	46
Met Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala	
-15 -10	

ntn ntn rtc nna gyt cag gcy ntn acy nan gna nan ntn nag nna Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys -5 1 5	91
nng nnc nar ayc agc rna rar tgy nar nnn gnr nny gga gtg tcn Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val Ser 10 15 20	136
naa gan ryn atn rnn ara gyy cgc ann ggt gnc tng gnn gay gay Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp 25 30 35	181
ccy aaa ntg aar nnn can nty yty tgc ntn nyn arg rnn nyy grn Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly 40 45 50	226
ntr gyn rcn gaa ncn gga gan ryn rnn gyn gan ryr ytn arr gnn Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala 55 60 65	271
aag ntg ang nrr nnn nnn rnn ann rnn rar rar ryn rrr arr ntn Lys Leu Lys His Val Ala Ser Asn Asp Glu Glu Val Asp Lys Ile 70 75 80	316
nyn nrr arn nnn nnn nnn nng arn rnn nyn nnn rar rnr nnn nnn Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala 85 90 95	361
tnn ran nyn yyn aan nnn nny nnn rrr ann arn ccn rnn tyy tyn Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser 100 105 110	406
cnn ryt rnt trn nnnnnnnnnn ynnngnnrrnr nttyranaat aaagnnnytn Pro Ile Asp 115	458
tnrtnnnrna aaaaaaaaaa aaaaaa	484

<210> 47  
 <211> 484  
 <212> DNA  
 <213> Tenebrio molitor  
  
 <220>  
 <221> misc\_feature  
 <222>  
 <223> Consensus of SEQ. ID #46 with AFP-3, 'n' defined as any nucleotide,  
 'Xaa' defined as any amino acid  
  
 <400> 47  
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 Met Lys Leu Leu Cys Phe Ala Phe Ala Ala  
 -15 -10  
  
 ntn ntn ryc nrr ryy yan gcy ntn acy nan rna nnn nnn nag nrr 91

Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys	
-5 1 5	
nng nny nar nnc agc rnn rnn tgy nar nnn gnr nny gga gtr tcn	136
Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Glu Ser Gly Val Ser	
10 15 20	
naa gan nyn ntn rnn arr gyy cgc ann ngd gnn nnr gnn gay gay	181
Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp	
25 30 35	
ccy aaa ntg aar nnn can nyy yty tgc ntn nyn arg rnn nyy grn	226
Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly	
40 45 50	
ntn ryn rnn gnn nnn ggn gan nyn nnn nyn gan nnn ntn arr rnn	271
Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala	
55 60 65	
aar ntn ang nnn nnn nnn rnn rnn nnn rar rar ryn rrn rrn ntn	316
Lys Leu Lys His Val Ala Ser Asn Asp Glu Glu Val Asp Lys Ile	
70 75 80	
nyn nnn arn nnn nnn nnn nng arn rnn nyn nnn nar nnn nnn nnn	361
Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala	
85 90 95	
nnn ran nyn yyn aan nnn nny nnn rrn ann arn ycn nnn tnn nnn	406
Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser	
100 105 110	
cnn nyn rnn trn nnnnnnnnnn ynnrrnnnnnn nnnnnnnnaat aaannnnnnn	458
Pro Ile Asp	
115	
nnnnnnnnna aaaaaaaaaa aaaaaa	484

<210> 48  
 <211> 136  
 <212> PRT  
 <213> Tenebrio molitor

<220>  
 <221> misc\_feature  
 <222>  
 <223> General Consensus of Clones, B1, B2 and AFP-3, 'n' defined as any nucleotide, 'Xaa' defined as any amino acid

<400> 48  
 Met Lys Leu Leu Xaa Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
 -15 -10 -5  
 Xaa Ala Xaa Thr Xaa Xaa Xaa Xaa Glx Xaa Xaa Xaa Xaa Xaa Ser Xaa  
 1 5 10

Xaa Cys Xaa Xaa Xaa Ser Gly Xaa Ser Glx Xaa Xaa Xaa Xaa Xaa Xaa  
15 20 25 30  
Arg Xaa Xaa Xaa Xaa Xaa Asp Asp Pro Lys Xaa Lys Xaa Xaa Xaa Xaa  
35 40 45  
Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Gly Xaa Xaa Xaa  
50 55 60  
Xaa Xaa Xaa Xaa Xaa Xaa Lys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Glu  
65 70 75  
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Lys Cys Xaa Val Xaa Xaa Xaa Thr Xaa  
80 85 90  
Glx Xaa Xaa Xaa Xaa Xaa Xaa Xaa Lys Xaa Xaa Xaa Xaa Xaa Xaa  
95 100 105 110  
Xaa Phe Xaa Xaa Xaa Xaa Xaa Xaa  
115